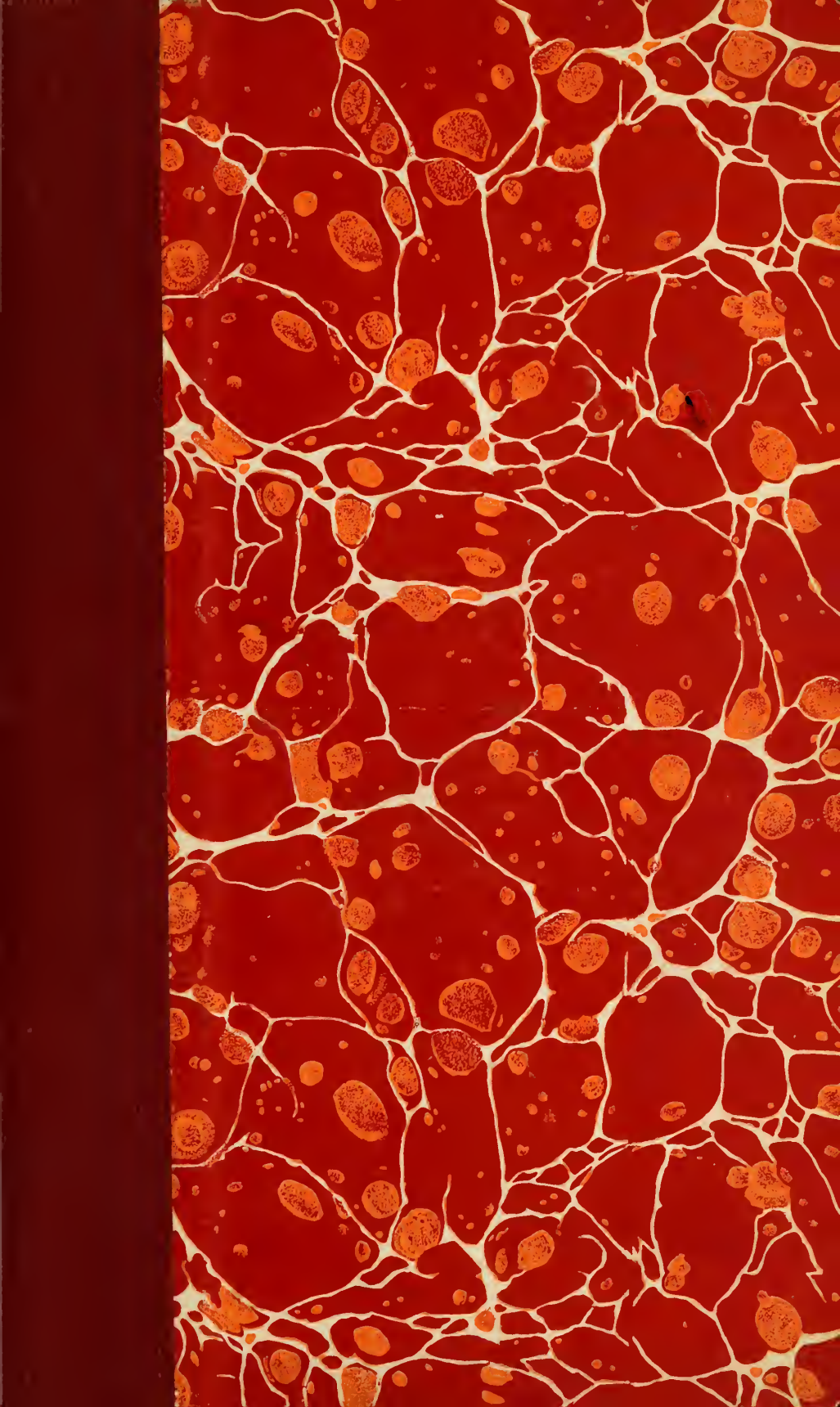


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TWENTIETH ANNUAL REPORT

OF THE

# Maine Agricultural Experiment Station

ORONO, MAINE.

1904.

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AUGUSTA  
KENNEBEC JOURNAL PRINT  
1905

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The Bulletins of this Station will be sent free to any address in Maine. All requests should be sent to

Agricultural Experiment Station,

Orono, Maine.



STATE OF MAINE.

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*Geo. E. Fellores, Ph. D., President of the University of Maine:*

SIR:—I transmit herewith the Twentieth Annual Report of the Maine Agricultural Experiment Station for the year ending December 31, 1904.

CHARLES D. WOODS,

*Director.*

ORONO, ME., December 31, 1904.

# MAINE

## AGRICULTURAL EXPERIMENT STATION,

### ORONO, MAINE.

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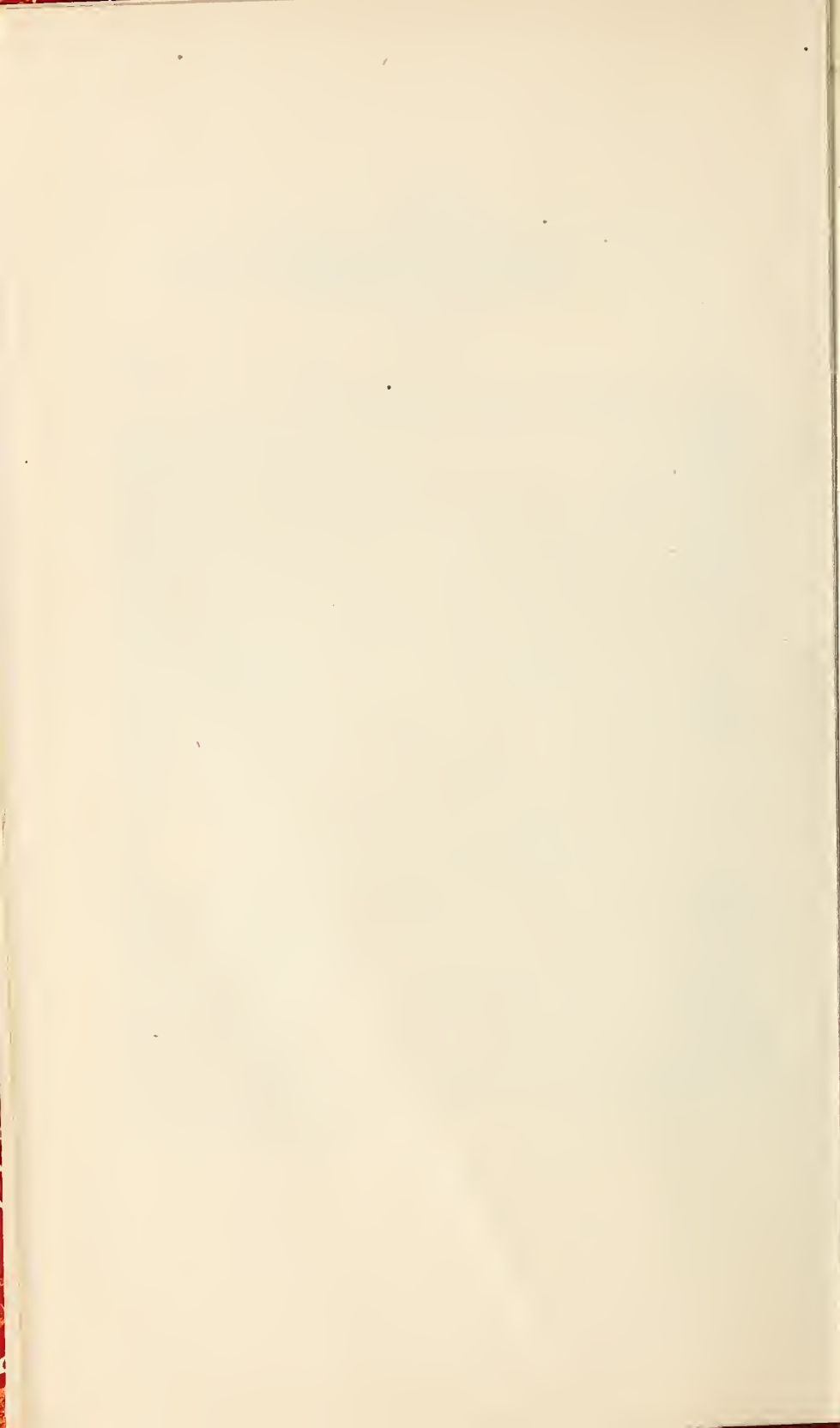
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HERMAN H. HANSON . . . . .	<i>Assistant Chemist</i>
SANFORD C. DINSMORE . . . . .	<i>Assistant Chemist</i>
MARSHALL P. CUMMINGS . . . . .	<i>Assistant in Horticulture</i>

\* Appointed April, 1904.

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## ANNOUNCEMENTS.

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### THE AIM OF THE STATION.

Every citizen of Maine concerned in agriculture has the right to apply to the Station for any assistance that comes within its province. It is the wish of the Trustees and Station Council that the Station be as widely useful as its resources will permit.

In addition to its work of investigation, the Station is prepared to make chemical analyses of fertilizers, feeding stuffs, dairy products and other agricultural materials; to test seeds and creamery glass-ware; to identify grasses, weeds, injurious fungi and insects, etc.; and to give information on agricultural matters of interest and advantage to the citizens of the State.

All work proper to the Experiment Station and of public benefit will be done without charge. Work for the private use of individuals is charged for at the actual cost to the Station. The Station offers to do this work only as a matter of accommodation. Under no condition will the Station undertake analyses, the results of which cannot be published, if they prove of general interest.

### INSPECTIONS.

The execution of the laws regulating the sale of commercial fertilizers, concentrated commercial feeding stuffs, and agricultural seeds, and the inspection of chemical glassware used by creameries is entrusted to the Director of the Station. The Station officers take pains to obtain for analysis samples of all brands of fertilizers and feeding stuffs coming under the law, but the organized co-operation of farmers is essential for the full and timely protection of their interests. Granges, Farmers' Clubs and other organizations can render efficient aid by reporting any attempt at evasion of the laws and by sending, early in the sea-

son, samples taken from stock in the market and drawn in accordance with the Station directions for sampling. In case there should be a number of samples of the same brand sent in, the Station reserves the right to analyze only in part.

#### STATION PUBLICATIONS.

The Station publishes several bulletins each year, covering in detail its expenses, operations, investigations and results. The bulletins are mailed free to all citizens who request them.

#### CORRESPONDENCE.

As far as practicable, letters are answered the day they are received. Letters sent to individual officers are liable to remain unanswered, in case the officer addressed is absent. All communications should, therefore, be addressed to the

Agricultural Experiment Station,  
Orono, Maine.

The post office, railroad station, freight, express and telegraph address is Orono, Maine. Visitors to the Station can take the electric cars at Bangor and Old Town.

The telephone call is "Orono 5."

Directions, forms and labels for taking samples of fertilizers, feeding stuffs and seeds for analysis can be had on application.

Parcels sent by express should be prepaid, and postage should be enclosed in private letters demanding a reply.

CHAS. D. WOODS, *Director.*



HOLMES HALL, 1888.



HOLMES HALL, 1899.



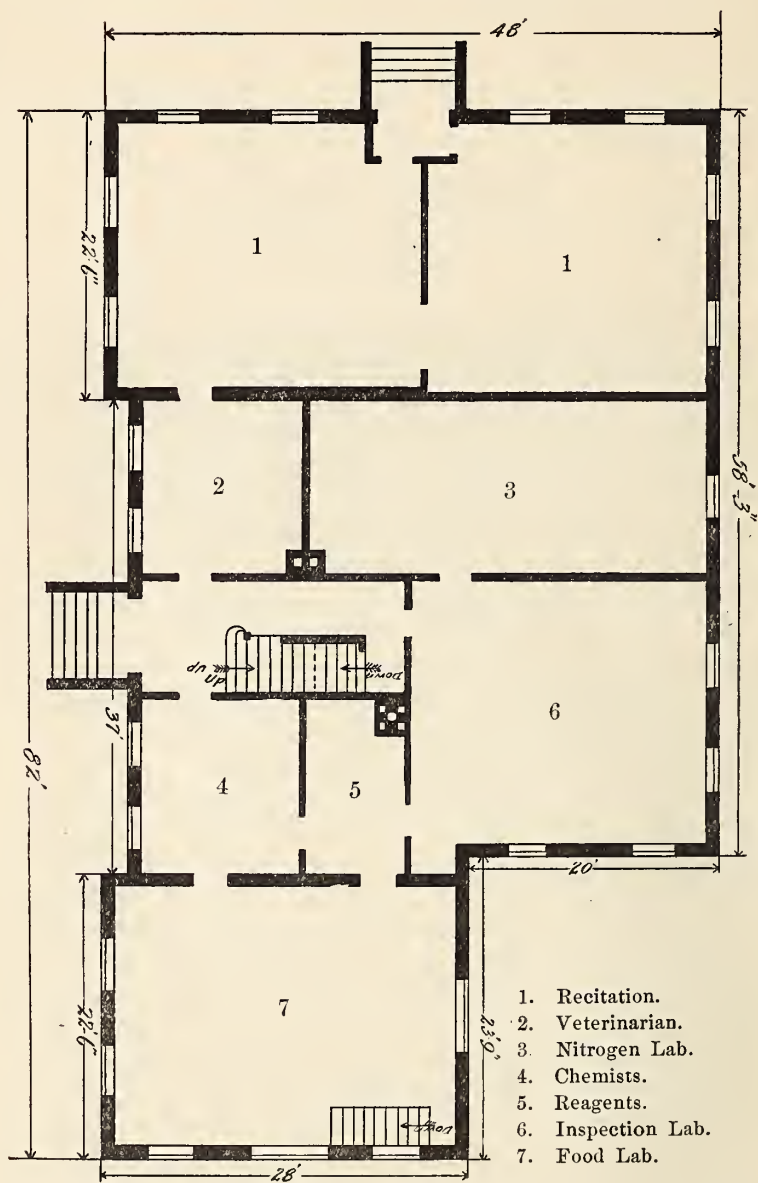


## HISTORICAL SKETCH.

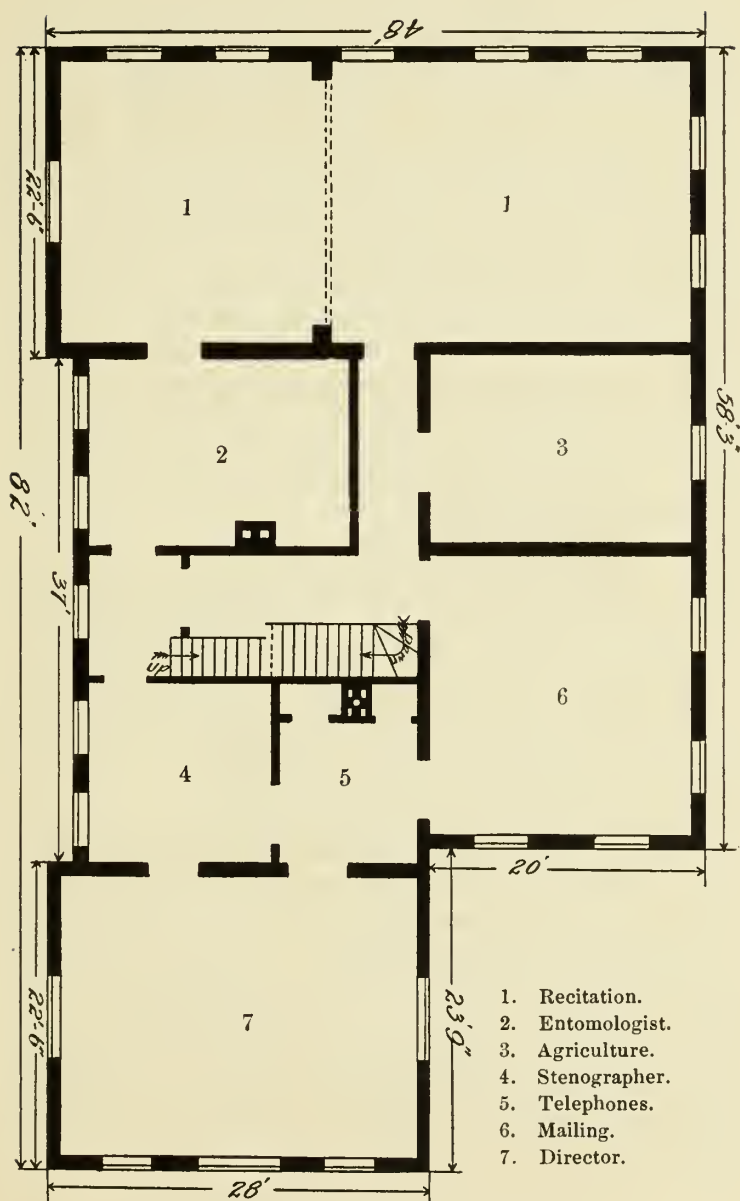
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The Maine Fertilizer Control and Agricultural Experiment Station was established by the Maine legislature of 1885, which appropriated the sum of \$5,000 a year for its maintenance. No provision, however, was made for a building for its accommodation, so the trustees of the State College offered it quarters, although it was established as an independent institution, and the Board of Managers gladly accepted the offer. A laboratory was provided in Fernald Hall and an office in Wingate Hall—the wooden building, since burned, which stood where the present Wingate Hall is located. This State Station was maintained until the passage by Congress of the Hatch Bill in 1887 placed at the disposal of the University the sum of \$15,000 annually for the maintenance of an Agricultural Experiment Station, after which it was discontinued.

The increase in the funds available for the support of a station permitted a considerable increase in the staff of investigation, and a consequent increase in its work, which made increased laboratory and office facilities imperative. To meet this demand, it was decided to erect a new building for the exclusive use of the Station, to be located upon the slight elevation to the east of Coburn Hall, one of the very best sites upon the campus. This building was constructed in 1887. It was built of brick with granite trimmings, and was two stories in height, with a one-story ell. In 1899 the building was enlarged by adding a wing to the south side, thus providing much needed space for food laboratories and the director's office. In the latter is placed the greater part of the station library of about 1,700 volumes. The appearance of the building in these two stages of its development is shown in the two illustrations.



HOLMES HALL, FIRST FLOOR PLAN.



HOLMES HALL, SECOND FLOOR PLAN.

In 1903-04, in accordance with a previous plan, a second wing was added on the north side, thus restoring the symmetry of the building. The structure thus completed is in the form of a rectangle 46 by 82 feet, with a re-entrant angle at the southeast corner. On the first floor (see plan, p. x) are the laboratory for the analysis of feeds and fertilizers, the nitrogen room, a room for the storage of chemicals, a food laboratory, offices of the chemists and veterinarian, and in the recently completed north wing, recitation rooms for the departments of horticulture and forestry. On the second floor (see plan, p. xi) are the director's office, rooms for the professor of agriculture, the entomologist, the stenographer, a mailing and reading room, a telephone room, and in the north wing a large room used for recitation and laboratory purposes by the department of agriculture. This room may be divided into two rooms or thrown into one by a rolling shutter.

The basement contains the boiler and coal rooms, a kitchen used in connection with nutrition investigations, a calorimeter room, a gas room, and rooms for the grinding and preparation of samples. In the attic are quarters for the janitor, a photographic dark room, and a storage room. The building is heated by steam, lighted by electricity, and furnished with gas. The total cost is somewhat in excess of \$18,000. The completed building is shown in the full page illustration.

The recent additions give a dignified building, designed and erected for agricultural investigation and instruction, and it seemed to the trustees of the University to be eminently fitting that it should bear the name of one of our most eminent pioneers in agricultural science, Ezekiel Holmes. This honor is the more deserved, since Dr. Holmes, over 60 years ago, urged the establishment in Aroostook county of a "State Experiment Farm;" and it was largely through his efforts that the Maine legislature in 1865 established the Maine State College as a separate and independent institution. Holmes Hall was formally dedicated on May 25, 1904.



LIST OF BULLETINS PUBLISHED IN 1904.

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100. Poultry Management.
101. Fertilizer Inspection.
102. Feeding Stuff Inspection.
103. Entire Wheat Flour.
104. A Study of Reciprocal Crosses.
105. Fertilizer Inspection.
106. Soy Beans. Feeding Experiments. Alfalfa.
107. Home Mixed Fertilizers.
108. Brown Tail Moth.
109. Apple Maggot. Insect Notes.
110. Digestion Experiments with Sheep and Steers.
111. Finances. Meteorology. Index.

# Maine Agricultural Experiment Station

BULLETIN No. 101.

MARCH, 1904.

## FERTILIZER INSPECTION.

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This Bulletin contains the analyses of Manufacturers' samples of brands of Fertilizers licensed before March 1, 1904. Dealers are cautioned to consult with the Station before offering brands not given in this Bulletin.

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Requests for bulletins should be addressed to the  
AGRICULTURAL EXPERIMENT STATION,  
Orono, Maine.

# MAINE

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### ORONO, MAINE.

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SANFORD C. DINSMORE . . . . .	<i>Assistant Chemist</i>



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## FERTILIZER INSPECTION.

CHAS. D. WOODS, Director.

J. M. BARTLETT, Chemist in Charge of Fertilizer Analysis.

10

The law regulating the sale of commercial fertilizers in this State calls for two bulletins each year. The first of these contains the analyses of the samples received from the manufacturer, guaranteed to represent, within reasonable limits, the goods to be placed upon the market later. The second bulletin contains the analyses of the samples collected in the open market by a representative of the Station.

In the tables which follow the discussion there are given the results of the analyses of the manufacturers' samples of licensed brands. The tables include all the brands which have been licensed to March 1, 1904. Dealers are cautioned against handling any brands not given in this list without first writing the Station.

The figures which are given as the percentages of valuable ingredients guaranteed by the manufacturers are the minimum percentages of the guarantee. If, for instance, the guarantee is 2 to 3 per cent of nitrogen, it is evident that the dealer cannot be held to have agreed to furnish more than 2 per cent and so this percentage is taken as actual guarantee. The figures under the head of "found" are those showing the actual composition of the samples.

To produce profitable crops and at the same time to maintain and even to increase the productive capacity of the soil may rightly be termed "good farming." Many farmers are able to do this, and the knowledge of how to do it has been largely acquired through years of experience, during which the character of the soil, its adaptability for crops, and the methods of its management and manuring have been made the subjects of careful study, without, however, any definite and accurate knowledge concerning manures and their functions in relation to soils and crops. To those who desire to study this question,

the Station will, on application, send a list of suitable books. Experience in the field, explained by experiments in the laboratory, has clearly demonstrated a few principles which underlie the successful and economical use of fertilizers.

Soils vary greatly in their capabilities of supplying food to crops. Different ingredients are deficient in different soils. The way to learn what materials are proper in a given case is by observation and experiment. The rational method for determining what ingredients of plant-food a soil fails to furnish in abundance, and how these lacking materials can be most economically supplied, is to put the questions to the soil with different fertilizing materials and get the reply in the crops produced. How to make these experiments is explained in Circular No. 8 of the Office of Experiment Stations of the U. S. Department of Agriculture. A copy of this circular can be had by applying to the Secretary of Agriculture, Washington, D. C., or to the Maine Agricultural Experiment Station.

The chief use of fertilizers is to supply plant-food. It is good farming to make the most of the natural resources of the soil and of the manures produced on the farm, and to depend upon artificial fertilizers only to furnish what more is needed. It is not good economy to pay high prices for materials which the soil may itself yield, but it is good economy to supply the lacking ones in the cheapest way. The rule in the purchase of costly commercial fertilizers should be to select those that supply, in the best forms and at the lowest cost, the plant-food which the crop needs and the soil fails to furnish.

Plants differ widely with respect to their capacities for gathering their food from soil and air; hence the proper fertilizer in a given case depends upon the crop as well as upon the soil. The fertility of the soil would remain practically unchanged if all the ingredients removed in the various farm products were restored to the land. This may be accomplished by feeding the crops grown on the farm to animals, carefully saving the manure and returning it to the soil. If it is practicable to pursue a system of stock feeding in which those products of the farm which are comparatively poor in fertilizing constituents are exchanged in the market for feeding stuffs of high fertilizing value, the loss of soil fertility may be reduced to a minimum or there may be an actual gain in fertility.

## CONSTITUENTS OF FERTILIZERS.\*

The only ingredients of plant-food which we ordinarily need to consider in fertilizers are potash, lime, sulphuric acid, phosphoric acid, and nitrogen. The available supply of sulphuric acid and lime is often insufficient; hence one reason for the good effect so often observed from the application of lime, and of plaster, which is a compound of lime and sulphuric acid. The remaining substances, nitrogen, phosphoric acid and potash, are the most important ingredients of our common commercial fertilizers, both because of their scarcity in the soil and their high cost. It is in supplying these that phosphates, bone manures, potash salts, guano, nitrate of soda, and most other commercial fertilizers are chiefly useful.

The term "form" as applied to a fertilizing constituent has reference to its combination or association with other constituents which may be useful, though not necessarily so. The form of the constituent, too, has an important bearing upon its availability, and hence upon its usefulness as plant food. Many materials containing the essential elements are practically worthless as sources of plant food because the form is not right; the plants are unable to extract them from their combinations; they are "unavailable." In many of these materials the forms may be changed by proper treatment, in which case they become valuable not because the element itself is changed, but because it then exists in such form as readily to feed the plant.

*Nitrogen* is the most expensive of the three essential fertilizing elements. It exists in three different forms, organic nitrogen, ammonia and nitrate.

*Organic nitrogen* exists in combination with other elements either as vegetable or animal matter. All materials containing organic nitrogen are valuable in proportion to their rapidity of decay, because change of form must take place before the nitrogen can serve as food. Organic nitrogen differs in availability not only according to the kind of material which supplies it, but according to the treatment it receives. The nitrogen in the tables of analyses marked "insoluble in water" is organic nitrogen.

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\* Farmers Bulletin 44 of the U. S. Dept. of Agriculture, "Commercial Fertilizers, Composition and Use," can be had free by applying to your Congressman.

*Nitrogen as ammonia* usually exists in commercial manures in the form of sulphate of ammonia and is more readily available than organic nitrogen. While nitrogen in the form of ammonia is extremely soluble in water, it is not readily removed from the soil by leaching as it is held by the organic compounds of the soil.

*Nitrogen as nitrate* exists in commercial products chiefly as nitrate of soda. Nitrogen in this form is directly and immediately available, no further changes being necessary. It is completely soluble in water, and diffuses readily throughout the soil. It differs from the ammonia compounds in forming no insoluble compounds with soil constituents and may be lost by leaching. The "Nitrogen soluble in water" of the tables includes both the nitrogen as ammonia and as nitrate.

*Phosphoric acid* is derived from materials called phosphates, in which it may exist in combination with lime, iron, or alumina as phosphates of lime, iron or alumina. Phosphate of lime is the form most largely used as a source of phosphoric acid. Phosphoric acid occurs in fertilizers in three forms: That soluble in water and readily taken up by plants; that insoluble in water, but still readily used by plants, also known as "reverted;" and that soluble only in strong acids and consequently very slowly used by the plant. The "soluble" and "reverted" together constitute the "available" phosphoric acid. The phosphoric acid in natural or untreated phosphates is insoluble in water, and not readily available to plants. If it is combined with organic substance, as in animal bone, the rate of decay is more rapid than if with purely mineral substances. The insoluble phosphates may be converted into soluble forms by treatment with strong acids. Such products are known as acid phosphates or superphosphates. The "insoluble phosphoric acid" of a high cost commercial fertilizer has little or no value to the purchaser because at the usual rate of application the quantity is too small to make any perceptible effect upon the crop, and because its presence in the fertilizer excludes an equal amount of more needful and valuable constituents.

*Potash* in commercial fertilizers exists chiefly as muriates and sulphates. With potash the form does not exert so great an influence upon availability as is the case with nitrogen and phosphoric acid. All forms are freely soluble in water, and are



believed to be nearly if not quite equally available as food. The form of the potash has an important influence upon the quality of certain crops. For example, the results of experiments seem to indicate that the quality of tobacco, potatoes, and certain other crops is unfavorably influenced by the use of muriate of potash, while the same crops show a superior quality if materials free from chlorides have been used as the source of potash.

#### VALUATION OF FERTILIZERS.

The agricultural value of any of the fertilizing constituents is measured by the value of the increase of the crop produced by its use, and is, of course, a variable factor, depending upon the availability of the constituents, and the value of the crop produced. The form of the materials used must be carefully considered in the use of manures. Slow-acting materials cannot be expected to give profitable returns upon quick growing crops, nor expensive materials profitable returns when used for crops of relatively low value.

The agricultural value is distinct from what is termed "commercial value," or cost in market. This value is determined by market and trade conditions, as cost of production of the crude material, methods of manipulation required, etc. Since there is no strict relation between agricultural and commercial or market value, it may happen that an element in its most available form, and under ordinary conditions of high agricultural value, costs less in market than the same element in less available forms and of a lower agricultural value. The commercial value has reference to the material as an article of commerce, hence commercial ratings of various fertilizers have reference to their relative cost and are used largely as a means by which the different materials may be compared.

The commercial valuation of a fertilizer consists in calculating the retail trade-value or cash-cost at freight centers (in raw material of good quality) of an amount of nitrogen, phosphoric acid and potash equal to that contained in one ton of the fertilizer. Plaster, lime, stable manure and nearly all of the less expensive fertilizers have variable prices, which bear no close relation to their chemical composition, but guanos, superphosphates, and similar articles, for which \$20 to \$45 per ton are paid, depend for their trade value exclusively on the sub-

stances, nitrogen, phosphoric acid and potash, which are comparatively costly and steady in price. The trade-value per pound of these ingredients is reckoned from the current market prices of the standard articles which furnish them to commerce. The consumer, in estimating the reasonable price to pay for high-grade fertilizers, should add to the trade-value of the above-named ingredients a suitable margin for the expenses of manufacture, etc., and for the convenience or other advantage incidental to their use.

For many years this Station has not printed an estimate of the commercial value of the different brands licensed in the State. If anyone wishes to calculate the commercial value he can do so by using the trade values adopted for 1904 by the Experiment Stations of Connecticut, Massachusetts, Rhode Island and New Jersey. These valuations represent the average retail prices at which these ingredients could be purchased during the three months preceding March 1, 1904, in ton lots at tide water in the states named. On account of the greater distance from the large markets the prices for Maine at tide water would probably be somewhat higher than those quoted.

## TRADE VALUES OF FERTILIZING INGREDIENTS FOR 1904.

	Cents per pound
Nitrogen in nitrates .....	16
in ammonia salts.....	17½
Organic nitrogen in dry and fine ground fish, meat and blood, and in mixed fertilizers..	17½
in fine bone and tankage.....	17
in coarse bone and tankage.....	12½
Phosphoric acid, water-soluble.....	4½
citrate-soluble .....	4
of fine ground bone and tankage...	4
of coarse bone and tankage.....	3
of cotton seed meal, castor pomace, and ashes.....	4
of mixed fertilizers, if insoluble in ammonium citrate.....	2
Potash as high grade sulphate and in forms free from muriate (or chlorides).....	5
as muriate.....	4¼

The commercial valuation will be accurate enough as a means of comparison if the following rule is adopted:

Multiply 3.5 by the percentage of nitrogen.

Multiply 0.8 by the percentage of available phosphoric acid.

Multiply 0.4 by the percentage of insoluble phosphoric acid.

Multiply 1.0 by the percentage of potash.

The sum of these four products will be the commercial valuation per ton on the basis taken.

Illustration. The table of analyses shows a certain fertilizer to have the following composition: Nitrogen 2.00 per cent; Available phosphoric acid 8.50 per cent; Insoluble phosphoric acid 3.50 per cent; Potash 3.25 per cent. The valuation in this case will be computed thus:

Nitrogen,	$3.5 \times 2.00,$	7.00
Available phosphoric acid,	$.8 \times 8.50,$	6.80
Insoluble phosphoric acid,	$0.4 \times 3.50,$	1.40
Potash,	$1.0 \times 3.25,$	3.25
Valuation per ton,		<hr/> \$18.45

Since this rule assumes all the nitrogen to be organic and all the potash to be in the form of the sulphate, it is evident that the valuations thus calculated must not be taken as the only guide in the choice of a fertilizer. At best the valuations can only serve to show the approximate cost of the several ingredients contained in the fertilizer in question. In every case the farmer should consider the needs of his soil before he begins to consider the cost. In many instances a little careful experimenting will show him that materials containing either nitrogen, potash, or phosphoric acid alone will serve his purpose as fully as a "complete fertilizer," in which he must pay for all three constituents, whether needed or not.

The results of the analyses of the manufacturers' samples of fertilizers are given on the following pages.

## DESCRIPTIVE LIST OF MANUFACTURERS' SAMPLES, 1904.

Station number.	Manufacturer, place of business and brand.
<b>THE AMERICAN AGRICULTURAL CHEM. CO., NEW YORK, N. Y.</b>	
3152	Bradley's Akaline Bone with Potash.....
3153	Bradley's Complete Manure for Potatoes and Vegetables.....
3154	Bradley's Complete Manure with 10% Potash ....
3155	Bradley's Corn Phosphate.....
3156	Bradley's Eureka Fertilizer.....
3157	Bradley's Niagara Phosphate .
3158	Bradley's Potato Fertilizer ....
3159	Bradley's Potato Manure.....
3160	Bradley's X. L. Superphosphate of Lime .....
3161	Clark's Cove Bay State Fertilizer. ....
3162	Clark's Cove Bay State Fertilizer, G. G... ..
3163	Clark's Cove Bay State Fertilizer for Seeding Down.....
3164	Clark's Cove Defiance Complete Manure.....
3165	Clark's Cove Great Planet Manure, A. A.....
3166	Clark's Cove King Philip Alkaline Guano.....
3167	Clark's Cove Potato Fertilizer ...
3168	Clark's Cove Potato Manure .....
3169	Cleveland Fertilizer for All Crops .....
3170	Cleveland High Grade Complete Manure .....
3171	Cleveland Potato Phosphate .
3172	Cleveland Seeding Down Fertilizer .....
3173	Cleveland Superphosphate.....
3174	Complete Manure with 10% Potash .
3175	Crocker's Aroostook Potato Special .....
3176	Crocker's Corn Phosphate. ....
3177	Crocker's Grass and Oats Fertilizer .....
3178	Crocker's New Rival Ammoniated Superphosphate .....
3179	Crocker's Potato, Hop and Tobacco .....
3180	Crocker's Special Potato Manure .....
3181	Cumherland Guano for All Crops.....
3182	Cumherland Potato Fertilizer .....
3183	Cumherland Seeding Down Manure .....
3184	Cumherland Superphosphate.....
3185	Darling's Blood, Bone and Potash.....
3186	Great Eastern General Fertilizer ....
3187	Great Eastern Grass and Oats Fertilizer. ....
3188	Great Eastern High Grade Potato Manure.....
3189	Great Eastern Northern Corn Special .....
3190	Great Eastern Potato Manure ....
3191	High Grade Fertilizer with 10% potash .....
3192	Lazaretto Aroostook Potato Guano .....
3193	Lazaretto Corn Guano .
3194	Lazaretto High Grade Potato Guano .....
3195	Lazaretto Propeller Potato Guano .....
3196	Lazaretto Wheat, Oats and Clover Fertilizer.....



## ANALYSES OF MANUFACTURERS' SAMPLES, 1904.

Station number.	NITROGEN.				PHOSPHORIC ACID.								POTASH.	
	Soluble in water.	Insoluble in water.	Total.		Soluble.	Reverted.	Insoluble.	Available.		Total.		Found.	Guaranteed.	
			Found.	Guaranteed.				Found.	Guaranteed.	Found.	Guaranteed.			
3152	%	%	%	%	%	%	%	%	%	%	%	%	%	
3153	1.06	2.40	3.46	3.30	5.36	3.32	1.51	8.68	8.00	10.19	9.00	6.91	7.00	
3154	1.99	1.31	3.30	3.30	3.59	3.19	2.44	6.78	6.00	9.22	7.00	11.20	10.00	
3155	0.66	1.42	2.08	2.06	7.05	2.55	2.56	9.60	8.00	12.16	10.00	2.01	1.50	
3156	0.11	1.06	1.17	1.03	5.93	2.35	1.55	8.28	8.00	9.83	10.00	2.32	2.00	
3157	0.40	0.64	1.04	0.82	5.41	3.15	1.38	8.56	7.00	9.94	8.00	1.49	1.00	
3158	0.77	1.22	1.99	2.06	5.74	4.74	2.54	10.48	8.00	13.02	10.00	3.17	3.00	
3159	0.81	1.58	2.39	2.50	2.89	3.80	3.18	6.69	6.00	9.87	8.00	5.15	5.00	
3160	1.10	1.36	2.46	2.50	6.74	3.16	1.80	9.90	9.00	11.70	11.00	2.68	2.00	
3161	1.14	1.32	2.46	2.50	7.26	3.08	1.80	10.34	9.00	12.14	11.00	2.35	2.00	
3162	0.62	1.40	2.02	2.06	7.21	2.42	2.36	2.63	8.00	11.99	10.00	1.95	1.50	
3163	0.41	0.74	1.15	1.03	5.93	2.80	2.42	8.73	8.00	11.15	10.00	2.57	2.00	
3164	0.40	0.68	1.08	0.82	5.24	2.74	1.48	7.98	7.00	9.46	8.00	1.59	1.00	
3165	1.88	1.52	3.40	3.30	5.20	3.01	1.96	8.21	8.00	10.17	9.00	7.43	7.00	
3166	0.43	0.68	1.11	1.03	5.71	2.67	1.47	8.38	8.00	9.85	10.00	2.12	2.00	
3167	0.91	1.03	1.94	2.06	6.49	5.31	0.40	11.80	8.00	12.20	10.00	3.35	3.00	
3168	0.56	2.11	2.67	2.50	3.96	3.03	3.49	6.99	6.00	10.48	8.00	5.59	5.00	
3169	0.34	0.72	1.06	1.03	5.50	2.87	2.60	8.37	8.00	10.97	10.00	2.30	2.00	
3170	2.02	1.21	3.23	3.30	4.96	3.41	2.27	8.37	8.00	10.64	9.00	7.53	7.00	
3171	0.62	1.34	1.96	2.06	5.95	3.99	2.74	9.94	8.00	12.68	10.00	3.03	3.00	
3172	0.11	1.06	1.17	1.03	5.79	2.89	1.27	8.68	8.00	9.95	10.00	2.20	2.00	
3173	0.66	1.40	2.06	2.06	7.17	2.35	2.62	9.52	8.00	12.14	10.00	2.03	1.50	
3174	1.34	1.72	3.06	3.30	3.84	2.33	2.11	6.17	6.00	8.28	7.00	10.19	10.00	
3175	0.81	1.29	2.10	2.06	5.17	3.33	2.03	8.50	8.00	10.53	.....	6.61	6.00	
3176	0.26	2.06	2.32	2.06	4.52	3.65	3.87	8.17	8.00	12.04	.....	2.26	1.50	
3177	.....	.....	.....	.....	7.54	4.28	1.79	11.82	11.00	13.61	.....	2.03	2.00	
3178	0.23	1.14	1.37	1.03	4.82	3.70	2.47	8.52	8.00	10.99	.....	2.12	2.00	
3179	1.10	1.10	2.20	2.06	5.98	2.07	2.68	8.05	8.00	10.73	.....	3.34	3.00	
3180	2.01	1.30	3.31	3.29	3.84	3.29	2.34	7.13	6.00	9.47	.....	10.80	10.00	
3181	0.03	1.23	1.26	1.03	6.22	3.00	2.49	9.22	8.00	11.71	10.00	2.28	2.00	
3182	0.72	1.34	2.06	2.06	6.13	4.17	2.33	10.30	8.00	12.63	10.00	3.38	3.00	
3183	0.44	0.72	1.16	1.03	5.42	2.98	2.53	8.40	8.00	10.93	10.00	2.53	2.00	
3184	0.56	1.38	1.94	2.06	7.01	2.38	2.55	9.39	8.00	11.94	10.00	2.35	1.50	
3185	2.26	1.64	3.90	4.10	2.81	4.44	2.40	7.25	7.00	9.65	8.00	7.41	7.00	
3186	*	*	1.10	0.82	0.69	9.25	2.26	9.94	8.00	12.20	.....	4.72	4.00	
3187	.....	.....	.....	.....	4.11	6.88	4.08	10.99	11.00	15.07	.....	2.15	2.00	
3188	2.38	1.00	3.38	3.29	4.87	3.25	1.86	8.12	6.00	9.98	.....	10.64	10.00	
3189	0.42	1.84	2.26	2.06	5.02	4.60	2.35	9.62	8.00	11.98	.....	2.26	1.50	
3190	0.85	1.23	2.08	2.06	5.92	2.31	2.76	8.23	8.00	10.99	.....	3.37	3.00	
3191	1.50	1.03	2.53	2.40	5.82	1.76	2.63	7.58	6.00	10.21	7.00	10.44	10.00	
3192	0.19	0.78	0.97	0.82	5.69	3.36	2.11	9.05	8.00	11.16	.....	4.57	4.00	
3193	0.95	1.02	1.97	1.64	4.47	3.20	2.74	7.67	8.00	10.41	.....	2.53	2.00	
3194	1.21	1.82	3.03	3.29	4.00	1.90	2.27	5.90	6.00	8.17	.....	10.60	10.00	
3195	0.70	1.30	2.00	2.06	5.69	2.56	2.88	8.25	8.00	11.13	.....	6.52	6.00	
3196	...	.....	.....	.....	8.60	3.86	1.00	12.16	11.00	13.16	.....	2.78	2.00	

\* Undetermined.

## DESCRIPTIVE LIST OF MANUFACTURERS' SAMPLES, 1904.

Station Number.	Manufacturer, place of business and brand.
<hr/>	
3197	Otis' Potato Fertilizer .....
3198	Otis' Seeding Down Fertilizer .....
3199	Otis' Superphosphate .....
3200	Pacific Dissolved Bone and Potash.....
3201	Pacific Grass and Grain Fertilizer .....
3202	Pacific High Grade General Fertilizer.....
3203	Pacific Nobsque Guano .....
3204	Pacific Potato Special .....
3205	Packers Union Animal Corn Fertilizer .....
3209	Packers Union Economical Vegetable Guano .....
3206	Packers Union Gardeners Complete Manure. ....
3207	Packers Union Potato Manure.....
3208	Packers Union Universal Fertilizer. ....
3210	Packers Union Wheat, Oats and Clover Fertilizer .....
3211	Quinnipiac Climax Phosphate for All Crops.....
3212	Quinnipiac Corn Manure. ....
3213	Quinnipiac Market Garden Manure .....
3214	Quinnipiac Mohawk Fertilizer .....
3215	Quinnipiac Potato Manure. ....
3216	Quinnipiac Potato Phosphate .....
3217	Quinnipiac Seeding Down Manure .....
3218	Read's Farmer's Friend.....
3219	Read's High Grade Farmer's Friend .....
3220	Read's Potato Manure .....
3221	Read's Practical Potato Special .....
3222	Read's Standard Superphosphate. ....
3223	Read's Sure Catch Fertilizer.....
3224	Read's Vegetable and Vine Fertilizer .....
3225	Soluble Pacific Guano. ....
3226	Standard A Brand. ....
3227	Standard Bone and Potash. ....
3228	Standard Complete Manure .....
3229	Standard Fertilizer .....
3230	Standard Guano for All Crops .....
3231	Standard Special for Potatoes .....
3232	Williams and Clark's Americus Ammoniated Bone Superphosphate .....
3233	Williams and Clark's Americus Corn Phosphate .....
3234	Williams and Clark's Americus High Grade Special .....
3235	Williams and Clark's Americus Potato Manure .....
3236	Williams and Clark's Americus with 10% Potash.....
3237	Williams and Clark's Royal Bone Phosphate for All Crops .....
THE BOWKER FERTILIZER CO., BOSTON, MASS.	
3238	Bowker's Bone and Potash Square Brand .....
3239	Bowker's Corn Phosphate .....
3240	Bowker's Early Potato Manure.....
3241	Bowker's Farm and Garden Phosphate .....
3242	Bowker's Fresh Ground Bone .....
3243	Bowker's Hill and Drill Phosphate .....

## ANALYSES OF MANUFACTURERS' SAMPLES, 1904.

Station number.	NITROGEN.				PHOSPHORIC ACID.								POTASH.	
	Soluble in water.	Insoluble in water.	Total.		Soluble.	Reverted.	Insoluble.	Available.		Total.		Found.	Guaranteed.	
			Found.	Guaranteed.				Found.	Guaranteed.	Found.	Guaranteed.			
3197	0.77	1.22	1.99	2.06	5.68	5.03	2.42	10.71	8.00	13.13	10.00	3.20	3.00	
3198	0.49	0.62	1.11	1.03	5.46	2.89	1.35	8.35	8.00	9.70	10.00	1.56	2.00	
3199	0.68	1.38	2.06	2.06	6.94	2.92	2.43	9.86	8.00	12.29	10.00	2.16	1.50	
3200	.....	.....	.....	.....	5.98	4.81	1.91	10.79	10.00	12.70	11.00	2.43	2.00	
3201	0.42	0.64	1.06	0.82	5.46	3.01	1.43	8.47	7.00	9.90	8.00	2.99	1.00	
3202	2.13	1.41	3.54	3.30	5.15	2.92	2.14	8.07	8.00	10.21	9.00	7.18	7.00	
3203	0.40	0.66	1.06	1.03	5.52	2.66	1.63	8.18	8.00	9.81	10.00	1.97	2.00	
3204	0.76	1.34	2.10	2.06	5.69	4.27	2.70	9.96	8.00	12.66	10.00	3.15	3.00	
3205	0.31	2.10	2.41	2.47	5.64	3.22	3.46	8.86	9.00	12.32	.....	1.91	2.00	
3209	0.26	1.47	1.68	1.25	4.65	2.55	2.15	7.20	6.00	9.35	.. ..	3.59	3.00	
3206	1.38	1.16	2.54	2.47	5.58	0.47	2.06	6.05	6.00	8.11	.....	10.99	10.00	
3207	0.96	1.10	2.06	2.06	4.85	3.16	1.85	8.01	8.00	9.86	.....	6.54	6.00	
3208	0.25	0.96	1.21	0.82	6.05	3.22	1.46	9.27	8.00	10.73	.....	5.04	4.00	
3210	.....	.....	.....	.....	.....	.....	1.20	10.92	11.00	12.12	.....	2.39	2.00	
3211	0.39	1.06	1.45	1.03	5.10	3.54	1.63	8.64	8.00	10.27	10.00	2.91	2.00	
3212	0.67	1.38	2.05	2.06	6.69	2.63	2.41	9.32	8.00	11.73	10.00	1.95	1.50	
3213	2.19	1.39	3.58	3.30	4.23	4.67	1.47	8.90	8.00	10.37	9.00	7.57	7.00	
3214	0.03	0.83	0.86	0.82	2.60	4.87	3.86	7.47	7.00	11.33	8.00	1.58	1.00	
3215	1.03	1.50	2.53	2.50	2.55	4.03	3.66	6.58	6.00	9.64	8.00	5.15	5.00	
3216	0.74	1.30	2.04	2.06	5.61	4.71	2.36	10.32	8.00	12.68	10.00	3.34	3.00	
3217	0.39	0.64	1.03	1.03	5.44	3.14	1.46	8.55	8.00	10.04	10.00	2.61	2.00	
3218	0.81	1.05	1.86	2.06	6.41	2.92	2.49	9.33	8.00	11.82	10.00	3.33	3.00	
3219	1.60	1.58	3.18	3.30	3.89	2.20	2.17	6.09	6.00	8.26	7.00	10.02	10.00	
3220	0.42	2.28	2.70	2.40	4.59	1.89	1.25	6.48	6.00	7.73	7.00	10.94	10.00	
3221	0.42	0.74	1.16	0.82	1.64	2.56	1.99	4.20	4.00	6.19	5.00	8.03	8.00	
3222	0.10	0.94	1.04	0.82	5.87	2.89	2.23	8.76	8.00	10.99	10.00	4.81	4.00	
3223	.....	.....	.....	.....	4.46	5.17	1.58	9.81	10.00	11.39	11.00	1.91	2.00	
3224	0.32	1.80	2.12	2.06	5.94	2.25	1.38	8.29	8.00	9.67	10.00	6.35	6.00	
3225	0.52	1.46	1.98	2.06	6.72	2.72	2.32	9.44	8.00	11.76	10.00	1.91	1.50	
3226	0.31	0.90	1.21	0.82	3.64	4.10	2.08	7.74	7.00	9.82	8.00	1.56	1.00	
3227	.....	.....	.....	.....	7.66	2.60	1.96	10.26	10.00	12.22	11.00	2.08	2.00	
3228	2.40	0.90	3.30	3.30	7.02	1.99	1.04	8.81	8.00	9.85	9.00	7.56	7.00	
3229	0.60	1.42	2.02	2.06	6.82	2.43	2.55	9.25	8.00	11.80	10.00	2.01	1.50	
3230	0.37	0.70	1.07	1.03	5.31	3.03	1.44	8.34	8.00	9.74	10.00	2.10	2.00	
3231	0.82	1.20	2.02	2.06	5.65	5.16	2.40	10.81	8.00	13.21	10.00	2.93	3.00	
3232	0.95	1.32	2.27	2.50	6.72	3.08	1.94	9.80	9.00	11.74	11.00	2.35	2.00	
3233	0.56	1.42	1.98	2.06	6.75	2.85	2.29	9.60	8.00	11.89	10.00	1.95	1.50	
3234	2.15	1.39	3.54	3.30	3.80	4.10	2.15	7.90	8.00	10.05	9.00	7.48	7.00	
3235	0.64	1.32	1.96	2.06	5.52	4.89	2.23	10.41	8.00	12.64	10.00	3.03	3.00	
3236	0.96	1.18	2.14	2.40	4.18	2.29	1.67	6.47	6.00	8.14	7.00	10.62	10.00	
3237	0.29	0.82	1.11	1.03	5.47	3.14	2.55	8.61	8.00	11.16	10.00	2.59	2.00	
3238	1.03	0.81	1.84	1.65	1.04	3.68	7.10	4.72	6.00	11.82	7.00	2.34	2.00	
3239	0.40	1.14	1.54	1.65	2.27	5.90	2.19	8.17	8.00	10.36	9.00	2.52	2.00	
3240	1.19	1.95	3.14	3.29	3.57	3.49	2.23	7.06	7.00	9.29	8.00	7.33	7.00	
3241	0.52	1.16	1.68	1.65	2.30	6.62	2.50	8.92	8.00	11.42	9.00	2.80	2.00	
3242	.....	.....	2.50	2.47	.....	.....	.....	.....	.....	19.09	18.00	.....	.....	
3243	0.71	1.73	2.44	2.47	3.27	5.48	2.76	8.75	9.00	11.51	10.00	2.16	2.00	

## DESCRIPTIVE LIST OF MANUFACTURERS' SAMPLES, 1904.

Station number.	Manufacturer, place of business and brand.
3244	Bowker's Market Garden Fertilizer .....
3245	Bowker's Potash Bone .....
3246	Bowker's Potash or Staple Phosphate .....
3247	Bowker's Potato and Vegetable Fertilizer .....
3248	Bowker's Potato and Vegetable Phosphate .....
3249	Bowker's Six Per Cent Fertilizer .....
3250	Bowker's Superphosphate with Potash for Grass and Grain .....
3251	Bowker's Sure Crop Phosphate .....
3252	Bowker's Ten Per Cent Manure .....
3253	Stockbridge Corn and Grain Manure .....
3254	Stockbridge Potato Manure .....
3255	Stockbridge Seeding Down Manure .....
	E. FRANK COE CO., NEW YORK CITY, N. Y.
3266	E. Frank Coe's Celebrated Special Potato Fertilizer .....
3266	E. Frank Coe's Columbian Corn Fertilizer .....
3267	E. Frank Coe's Columbian Potato Fertilizer .....
3258	E. Frank Coe's Excelsior Potato Fertilizer .....
3259	E. Frank Coe's Grass and Grain Fertilizer .....
3260	E. Frank Coe's High Grade Ammoniated Bone Superphosphate .....
3261	E. Frank Coe's High Grade Potato Fertilizer .....
3262	E. Frank Coe's New Englander Corn Fertilizer .....
3263	E. Frank Coe's New Englander Potato Fertilizer .....
3264	E. Frank Coe's Prize Brand Grain and Grass Fertilizer .....
3265	E. Frank Coe's Red Brand Excelsior Guano .....
3267	E. Frank Coe's Standard Grade Ammoniated Bone Superphosphate .....
	JOHN WATSON COMPANY, HOULTON, ME.
3268	Watson's Improved High Grade Potato Manure .....
	LISTER'S AGRICULTURAL CHEMICAL WORKS, NEWARK, N. J.
3269	Lister's Animal Bone and Potash .....
3270	Lister's High Grade Special for Spring Crops .....
3271	Lister's Oneida Special .....
3272	Lister's Potato Manure .....
3273	Lister's Special Corn Fertilizer .....
3274	Lister's Special Potato Fertilizer .....
3275	Lister's Success Fertilizer .....
	NATIONAL FERTILIZER CO., BRIDGEPORT, CONN.
3276	Chittenden's Ammoniated Bone Phosphate* .....
3277	Chittenden's Complete Root* .....
3278	Chittenden's Market Garden .....
	NEW ENGLAND FERTILIZER CO., BOSTON, MASS.
3279	New England Corn and Grain Fertilizer .....
3280	New England Corn Phosphate .....
3281	New England High Grade Potato Fertilizer .....
3282	New England Potato Fertilizer .....
3283	New England Superphosphate .....

\* Samples not received.



## ANALYSES OF MANUFACTURERS' SAMPLES, 1904.

Station number.	NITROGEN.				PHOSPHORIC ACID.								POTASH.	
	Soluble in water.	Insoluble in water.	Total.		Soluble.	Reverted.	Insoluble.	Available.		Total.		Found.	Guaranteed.	
			Found.	Guaranteed.				Found.	Guaranteed.	Found.	Guaranteed.			
3244	%	%	%	%	%	%	%	%	%	%	%	%	%	
3245	0.90	.....	0.90	0.82	3.05	1.93	3.03	4.98	6.00	8.01	7.00	2.10	2.00	
3246	0.18	0.74	0.92	0.82	1.69	6.43	2.15	8.12	8.00	10.27	9.00	3.37	3.00	
3247	0.61	1.73	2.34	2.47	7.26	2.32	0.83	9.58	8.00	10.41	10.00	4.30	4.00	
3248	0.30	1.18	1.48	1.65	2.28	6.79	2.31	9.07	9.00	11.38	10.00	2.32	2.00	
3249	0.35	0.65	1.00	0.82	1.39	4.82	3.05	6.21	6.00	9.26	7.00	6.48	6.00	
3250	.....	.....	.....	.....	4.39	5.30	1.71	9.69	10.00	11.40	11.00	2.84	2.00	
3251	0.35	0.72	1.07	0.82	4.93	3.50	2.42	8.43	9.00	10.85	10.00	2.37	2.00	
3252	0.17	0.69	0.86	0.82	1.29	3.92	1.99	5.21	5.00	7.20	6.00	10.34	10.00	
3253	1.29	1.97	3.26	3.29	3.51	1.59	2.04	8.10	7.00	10.14	8.00	7.24	7.00	
3254	1.32	1.88	3.20	3.29	2.57	3.54	2.27	6.11	6.00	8.38	7.00	10.34	10.00	
3255	0.79	1.59	2.38	2.47	2.97	2.88	4.24	5.85	6.00	10.09	9.00	10.04	10.00	
3266	1.26	0.62	1.88	1.65	7.34	1.19	2.71	8.53	8.00	11.24	9.50	4.73	4.00	
3256	0.60	0.74	1.34	1.23	7.29	2.77	2.53	9.46	8.50	12.01	10.50	2.98	2.50	
3257	0.54	0.80	1.34	1.23	6.30	2.16	2.49	9.46	8.50	11.95	10.50	3.08	2.50	
3258	1.46	0.96	2.42	2.50	6.03	1.97	2.22	8.00	7.00	10.22	9.00	9.35	8.00	
3259	0.07	0.73	0.80	0.80	6.73	2.57	2.81	9.30	8.50	12.11	10.00	2.28	1.50	
3260	1.02	1.06	2.08	1.85	6.76	2.26	2.30	9.02	9.00	11.32	13.00	3.09	2.25	
3261	1.68	0.92	2.60	2.40	7.15	1.53	2.76	8.68	7.50	11.44	.....	6.48	6.00	
3262	0.63	0.70	1.33	0.80	7.15	2.42	2.60	9.57	7.50	12.17	8.50	3.11	3.00	
3263	0.37	0.66	1.03	0.80	6.09	2.36	2.78	8.45	7.50	11.23	8.50	3.28	3.00	
3264	.....	.....	.....	.....	6.64	3.96	3.06	10.55	10.50	13.61	12.00	2.59	2.00	
3265	2.30	1.07	3.37	3.40	7.59	2.14	1.77	9.73	9.00	11.50	11.00	6.74	6.00	
3267	0.63	0.56	1.19	1.20	6.03	2.50	2.70	8.53	8.50	11.23	10.00	3.90	2.00	
3268	1.70	1.20	2.90	3.00	4.37	1.50	.75	5.87	6.00	6.62	9.00	5.23	5.00	
3269	.....	.....	.....	.....	7.07	2.96	2.04	10.03	10.00	12.07	.....	2.93	2.00	
3270	0.45	1.50	1.95	1.65	3.75	4.34	3.07	8.09	8.00	11.16	10.00	11.16	10.00	
3271	0.34	0.83	1.17	0.82	4.42	3.71	2.48	8.13	7.00	10.61	8.00	1.16	1.00	
3272	1.92	1.25	3.17	3.30	5.50	2.46	3.09	7.96	8.00	11.05	9.00	7.22	7.00	
3273	0.70	1.12	1.82	1.65	5.63	3.72	2.39	9.35	8.00	11.74	9.00	3.66	3.00	
3274	0.64	1.22	1.86	1.65	5.66	3.94	2.19	9.60	8.00	11.79	9.00	3.52	3.00	
3275	0.31	0.99	1.30	1.24	6.16	3.02	2.58	9.18	9.00	11.76	11.00	2.37	2.00	
3276	.....	.....	.....	1.70	.....	.....	.....	.....	8.00	.....	10.00	.....	2.00	
3277	.....	.....	.....	3.30	.....	.....	.....	.....	8.00	.....	10.00	.....	6.00	
3278	1.16	1.26	2.42	2.40	3.70	2.49	2.17	6.19	6.00	8.36	8.00	5.63	5.00	
3279	0.44	0.76	1.20	1.22	5.66	1.40	0.55	7.06	7.00	7.61	8.00	2.05	2.00	
3280	0.76	1.02	1.78	1.64	3.85	4.93	1.33	8.78	8.00	10.11	9.00	3.23	3.00	
3281	1.28	1.20	2.48	2.46	5.65	2.33	2.16	8.03	8.00	10.19	9.00	6.18	6.00	
3282	0.88	0.88	1.76	1.64	3.46	4.89	0.98	8.35	7.00	9.33	8.00	4.28	4.00	
3283	1.24	1.24	2.48	2.46	7.58	1.63	1.05	9.21	9.00	10.26	10.00	4.54	4.00	

## DESCRIPTIVE LIST OF MANUFACTURERS' SAMPLES, 1904.

Station number.	Manufacturer, place of business and brand.
	THE PARMENTER & POLSEY FERTILIZER CO., PEABODY, MASS.
3284	A A Brand Fertilizer.....
3285	Aroostook Special Brand.....
3286	Grain Grower Brand.....
3287	Ground Bone Brand.....
3288	P. & P. Potato Brand.....
3289	Plymouth Rock Brand.....
3290	Special Potato Brand.....
3291	Star Brand Superphosphate.....
	PORTLAND RENDERING CO., PORTLAND, ME.
3292	Bone Tankage.....
	PROVINCIAL CHEMICAL FERTILIZER CO., LIMITED, ST. JOHN, N. B.
3293	Potato Phosphate.....
	RUSSIA CEMENT CO., GLOUCESTER, MASS.
3294	Essex A 1 Superphosphate.....
3295	Essex Complete Manure for Corn, Grain and Grass.....
3296	Essex Complete Manure for Potatoes, Roots and Vegetables.....
3297	Essex Corn Fertilizer.....
3298	Essex Market Garden and Potato Manure.....
3299	Essex XXX Fish and Potash.....
	SAGADAHOC FERTILIZER CO., BOWDOINHAM, ME.
3300	Aroostook Potato Manure *.....
3301	Dirigo Fertilizer.....
3302	Sagadahoc High Grade Superphosphate.....
3303	Special Clover Fertilizer.....
3304	Sagadahoc Special Potato Fertilizer*.....
3305	XX Chemicals.....
3306	Yankee Fertilizer.....
3307	Acid Phosphate.....
3308	Muriate of Potash.....
3309	Nitrate of Soda.....
	THE SCIENTIFIC FERTILIZER CO., PITTSBURG, PA.
3317	Scientific "Bone, Meat and Potash".....
3318	Scientific "Corn and Grain".....
3319	Scientific "Economy".....
3320	Scientific Potato Fertilizer.....
	SWIFT'S LOWELL FERTILIZER CO., BOSTON, MASS.
3310	Swift's Lowell Animal Brand.....
3311	Swift's Lowell Bone Fertilizer.....
3312	Swift's Lowell Cereal Fertilizer.....
3313	Swift's Lowell Dissolved Bone and Potash.....
3314	Swift's Lowell Ground Bone.....
3315	Swift's Lowell Potato Manure.....
3316	Swift's Lowell Potato Phosphate.....

\* Samples received too late for analysis.

## ANALYSES OF MANUFACTURERS' SAMPLES, 1904.

Station number.	NITROGEN.				PHOSPHORIC ACID.								POTASH.	
	Soluble in water.	Insoluble in water.	Total.		Soluble.	Reverted.	Insoluble.	Available.		Total.		Found.	Guaranteed.	
			Found.	Guaranteed.				Found.	Guaranteed.	Found.	Guaranteed.			
3284	2.93	0.92	3.85	4.10	2.81	4.75	0.64	7.56	7.00	8.20	8.00	8.79	8.00	
3285	2.49	1.16	3.65	3.70	4.33	3.21	0.66	7.54	7.00	8.20	8.00	10.33	10.00	
3286	0.59	0.61	1.20	0.82	3.30	4.45	4.32	7.75	7.00	12.07	8.00	2.70	2.00	
3287	.....	.....	1.80	2.47	.....	.....	.....	.....	5.00	20.13	23.00	.....	.....	
3288	1.00	0.84	1.84	1.64	2.36	5.15	0.99	7.51	6.00	8.50	7.00	6.91	6.00	
3289	0.21	2.08	2.29	2.47	3.81	4.21	1.38	8.02	8.00	9.40	9.00	4.19	4.00	
3290	1.69	1.29	2.98	3.29	4.21	4.27	1.29	8.48	8.00	9.77	9.00	7.41	7.00	
3291	1.01	0.79	1.80	1.64	3.80	3.54	1.15	7.34	7.00	8.49	8.00	2.60	2.50	
3292	2.69	3.43	6.12	5.30	....	....	4.85	9.57	7.10	14.42	15.30	....	.....	
3293	0.38	1.38	1.76	1.23	5.76	1.18	4.54	6.94	8.00	11.48	.....	7.34	6.50	
3294	0.18	1.34	1.52	1.00	1.96	5.32	4.93	7.29	7.00	12.22	9.00	2.11	2.00	
3295	0.97	2.91	3.88	3.30	5.90	3.75	1.50	9.65	7.00	11.15	9.50	9.36	9.50	
3296	0.96	3.22	4.18	3.70	6.33	2.62	3.14	8.95	7.00	12.09	9.00	8.39	8.50	
3297	0.52	1.72	2.24	2.00	5.31	4.03	4.14	9.34	8.50	13.48	10.50	3.33	3.00	
3298	0.79	1.55	2.34	2.00	5.25	5.17	2.65	10.42	8.00	13.07	10.00	5.06	5.00	
3299	0.56	1.82	2.38	2.10	6.14	2.70	3.28	8.84	9.00	12.12	12.00	4.11	2.25	
3300	.....	.....	.....	1.25	....	....	.....	.....	6.00	.....	7.00	....	4.00	
3301	.....	1.02	1.02	1.10	2.04	3.13	5.74	5.17	6.00	10.91	10.00	4.04	2.00	
3302	1.04	1.01	2.05	2.00	4.21	4.13	1.79	8.34	6.00	10.13	7.00	5.16	3.00	
3303	0.45	0.75	1.20	0.85	3.94	6.20	2.76	10.14	7.00	12.90	8.00	.....	.....	
3304	.....	.....	.....	2.25	.....	.....	.....	.....	7.00	.....	8.00	.....	8.00	
3305	7.03	1.07	8.10	7.00	.....	.....	3.76	4.29	.....	8.05	7.00	10.05	8.00	
3306	0.35	0.41	0.76	0.40	7.30	2.73	1.04	10.03	7.00	11.07	8.00	3.05	2.00	
3307	.....	.....	.....	....	12.23	4.51	0.68	16.74	15.00	17.42	17.00	.....	.....	
3308	.....	.....	.....	....	.....	.....	.....	.....	.....	.....	.....	53.60	50.00	
3309	15.84	.....	15.84	15.00	....	.....	.....	.....	.....	.....	.....	.....	.....	
3317	0.70	2.32	3.02	3.29	4.43	1.55	3.14	5.98	8.00	9.12	10.00	8.55	8.00	
3318	0.52	1.32	1.87	1.65	5.55	1.71	1.51	7.26	8.00	8.77	10.00	2.47	2.00	
3319	0.52	1.24	1.76	1.65	6.16	1.71	1.64	7.87	9.00	9.51	10.00	4.16	4.00	
3320	0.71	1.92	2.63	2.47	4.26	1.20	2.70	5.46	8.00	8.16	10.00	6.23	6.00	
3310	.86	1.46	2.32	2.46	7.85	1.34	0.94	9.19	9.00	10.13	10.00	4.55	4.00	
3311	0.73	0.94	1.67	1.64	5.26	2.76	1.79	8.02	8.00	9.81	9.00	3.20	3.00	
3312	0.34	0.50	0.84	0.81	5.22	1.76	1.32	6.98	7.00	8.30	8.00	1.18	1.00	
3313	0.54	1.08	1.62	1.64	7.11	1.65	1.02	8.76	9.00	9.78	10.00	2.14	2.00	
3314	.....	.....	2.87	2.46	.....	.....	.....	.....	5.00	22.86	23.00	....	.....	
3315	0.56	0.96	1.52	1.64	4.55	2.34	1.40	6.89	7.00	8.29	8.00	4.24	4.00	
3316	1.31	1.16	2.47	2.46	5.66	2.49	1.71	8.15	8.00	9.86	9.00	6.35	6.00	

## THE CHIEF PROVISIONS OF THE FERTILIZER LAW APPLYING TO MANUFACTURERS, IMPORTERS AND DEALERS.

The law for the regulation of the sale and analyses of commercial fertilizers makes the following requirements upon manufacturers, importers or dealers who propose to sell or offer for sale commercial fertilizers in the State:

1. *The Brand.* Each package shall bear, conspicuously printed, the following statements:

The number of net pounds contained in each package.

The name or trade mark under which it is sold.

The name of the manufacturer or shipper.

The place of manufacture.

The place of business of manufacturer or shipper.

The percentage of nitrogen or its equivalent in ammonia.

The percentage of potash soluble in water.

The percentage of phosphoric acid in available form.

The percentage of total phosphoric acid.

2. *The Certificate.* There shall be filed annually between Nov. 15 and Dec. 15 with the Director of the Station a certificate containing an accurate statement of the brand. This certificate applies to the next succeeding calendar year. (Blanks for this purpose will be furnished on application to the Station.)

3. *Manufacturers' samples.* There shall be deposited annually, unless excused by the Director under certain conditions, a sample of fertilizer, with an accompanying affidavit that this sample "corresponds within reasonable limits to the fertilizer which it represents."

4. *Analysis fee.* For each brand of fertilizer sold or offered for sale in the State there shall be paid annually to the Treasurer of State "an analysis fee as follows: Ten dollars for the phosphoric acid and five dollars each for the nitrogen and potash, contained or said to be contained in the fertilizer."

5. *The license.* Upon receipt of the fee, the certificate and the sample (if required), the Director of the Station "shall issue a certificate of compliance."

[The full text of the law will be sent to those asking for it.]

CHAS. D. WOODS, *Director.*





